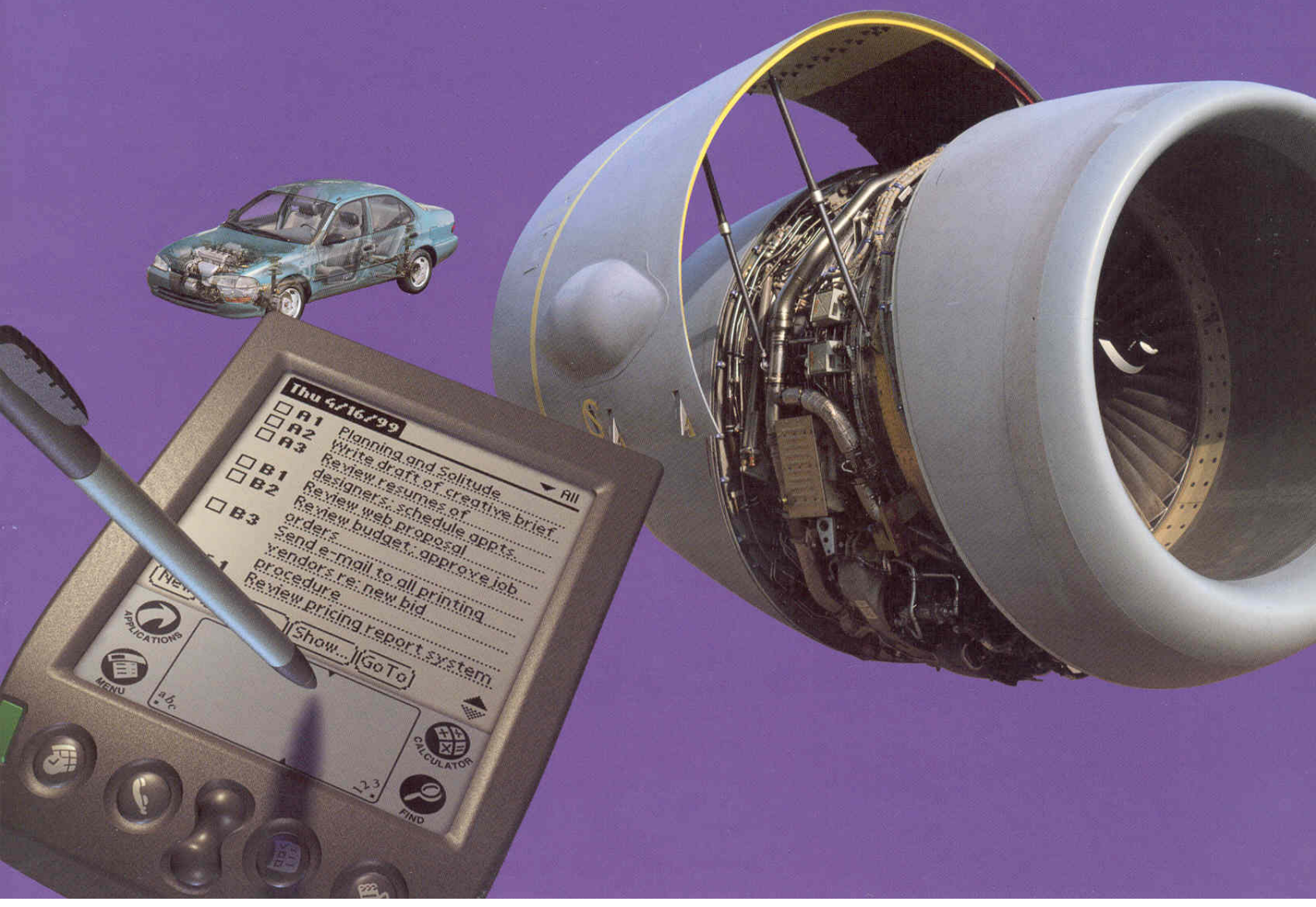
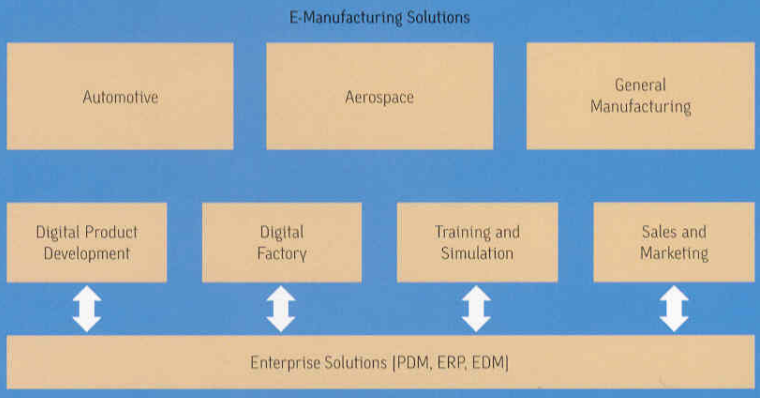
Solutions Brochure

Solutions for the Manufacturing Industry



A Strategic Partner for Manufacturing Companies



Manufacturers share many common objectives, including reducing time-to-market, lowering manufacturing costs, and perpetually improving the quality of their products. To do so successfully requires keeping up with the many complexities of today's highly advanced manufacturing environments and improving the communication of everyone involved in the processes.

For nearly two decades, SGI has helped manufacturers accomplish these objectives. Working in partnership with our manufacturing customers to implement systems that effectively enhance productivity while lowering costs, we begin by equipping our customers with the highest performance computing platforms in the world. But it doesn't end there. In an effort to provide state-of-the-art solutions, we work hand in hand with the world's leading software providers to tune and optimize software for SGI™ platforms. We also work closely with customers on an individual basis, providing the consulting services necessary to match the right solution to the specific manufacturing challenge.

The result: SGI offers its customers not only systems, but strategies to take advantage of solutions that provide amazing insights into product design, development, marketing, sales, and maintenance.

Digital Product Development

Digital product development (DPD) is a collaborative process that now encompasses CAD, CAE, FEA, CFD, and digital prototyping. Used to design and analyze a product, all of these disciplines revolve around defining and analyzing geometry. Styling, kinematics, assembly sequencing, and a number of additional DPD techniques require integrated and powerful hardware and software platforms.

SGI is uniquely positioned to deliver manufacturers complete product development solutions. We work with the leading software vendors to fulfill the specific needs of the customer's environment. These applications are powered by our broad product line that includes desktop Windows NT® and UNIX® workstations; highly scalable, multiprocessor Windows NT, Linux®, and UNIX servers; and Silicon Graphics® Onyx2™, the ultimate high-performance system for visualization.

A major contributor to SGI's continued success in working with world-class manufacturing companies is SGI Reality Center™. An immersive collaborative visualization facility designed to support multiple processes, SGI Reality Center features fully integrated, customized projection and display systems that are available in a variety of configurations.

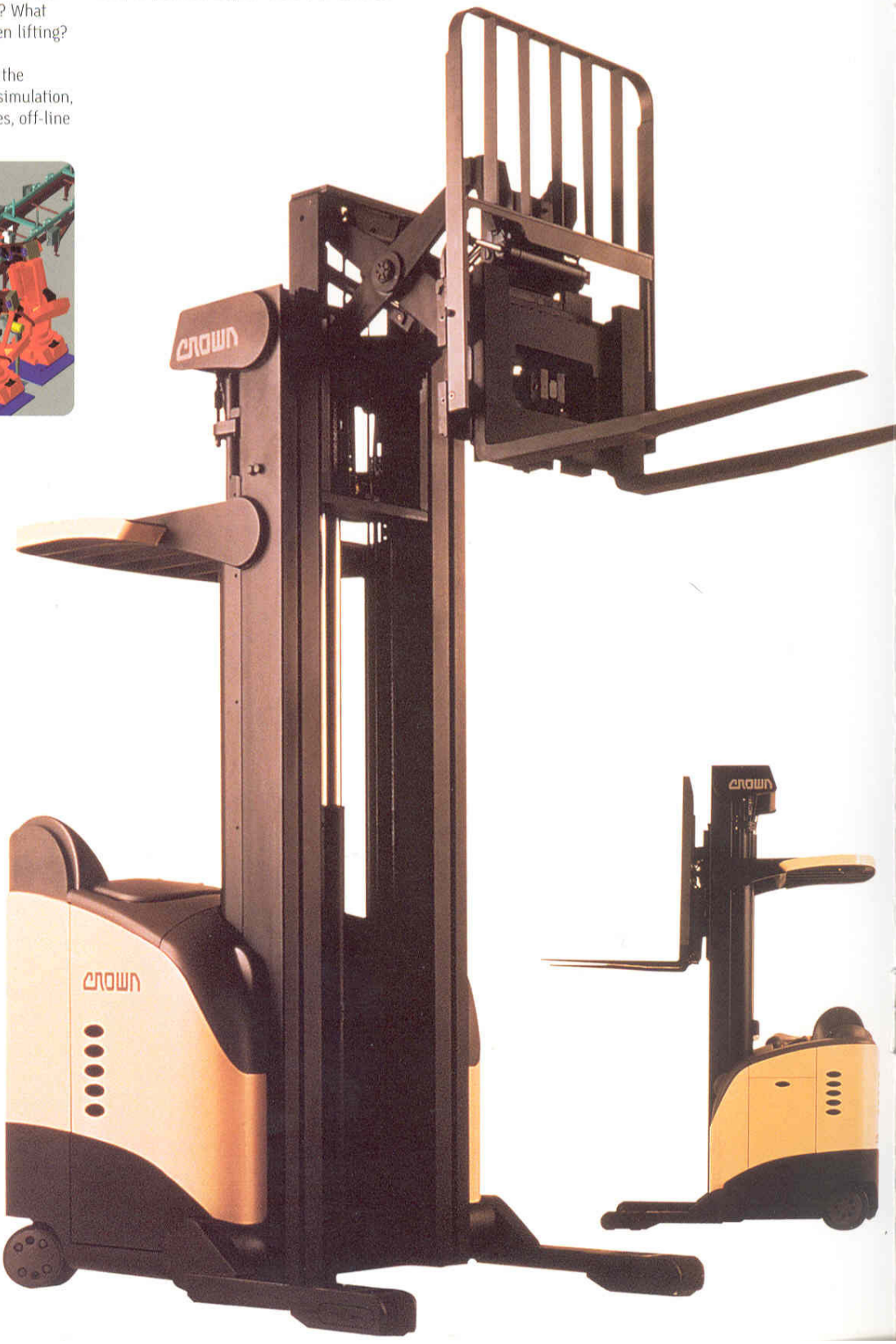
In an SGI Reality Center facility, users are immersed in their data, allowing interaction that extends beyond what is possible in the physical world. Before products are actually produced, SGI Reality Center users can work with products in a high-fidelity 1:1 scale. Applications extend beyond engineering and design review to data analysis, factory floor simulation, training, and presentations. SGI Reality Center is an enormously advantageous tool for expediting insight into complex problems, reducing production costs, increasing production output, and enabling collaborative decision-making, all leading to avoidance of costly mistakes before production commences.

SGI's commitment to providing the most advanced product development solutions is further evidenced by our ClearCoat™ styling technologies. Used in conjunction with the Silicon Graphics Onyx2 InfiniteReality2™ system, ClearCoat enables accurate digital reproduction of highly reflective materials such as paint, varnished surfaces, metal, and glass. In an SGI Reality Center facility, ClearCoat allows stylists to work interactively with models that look incredibly real.

Digital Factory

The tools used to optimize the product development process can also deliver major benefits in manufacturing processes. SGI helps customers use these tools to create a Digital Factory. The Digital Factory uses digital technology to address the many challenges manufacturers face. How should the factory be laid out? Where are robots and assemblers best placed? At what speed should the assembly line operate? Where are materials introduced? Can a human reach the parts bin? What stresses will be placed on a person's back when lifting?

A great many processes are performed within the Digital Factory: line balancing, discrete event simulation, robotics simulation, ergonomics, motion studies, off-line programming, process data management, and more. The integration of these advanced CAM techniques into an environment requires a thorough mastery of visualization technologies that only SGI and its many application partners can provide. SGI delivers the scalable products, high-performance graphics capabilities, and strong relationships with application vendors required to successfully implement Digital Factory processes.



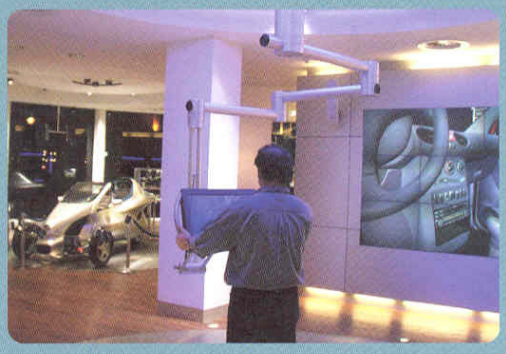
Training and Simulation

Digital prototyping technology from SGI and its partners provides unique benefits for training workers, maintenance personnel, and even end users. Consider a scenario that involves potentially dangerous procedures on a production line where a person must work with extremely hot metals. Safety is paramount, and on-the-job training introduces the risk of serious injury to the operator and others in the vicinity. Off-line digital training eliminates the danger and contains costs by reducing materials waste.

Similarly, maintenance and operation procedures can be simulated. Before a product is physically produced, maintenance personnel can be trained and be prepared to respond to the first call when the product is finally in the hands of the customer. Pilots can be ready to fly the first test plane off the production line. Crews can learn how to dock a ship at any port around the world. Companies that want to conduct training throughout their geographically dispersed organizations can count on SGI technology to implement these types of solutions.

Marketing and Sales

High-performance visualization solutions applied in marketing and sales activities can greatly enhance the bottom line. Using virtual reality, a marketing organization can conduct focus group studies demonstrating products that are still in development. Potential customers can evaluate shapes, styles, and colors. Sales organizations can create virtual showrooms for products, eliminating the need to stock all possible color choices and models. Many SGI customers are already realizing these benefits, and the possibilities are immense.



Enterprise Solutions

All across the enterprise, manufacturing organizations must now integrate and manage supply chains to improve relationships with their customers and various constituents. SGI provides "portals" that combine users, the Web, and traditional sources of information to reduce cycle times, improve quality, and increase company profits.

The creation of a company portal allows employees online access to both the internal and the external information resources they need, such as inventory and customer management data from sales and support groups. Portal solutions address supply chain integration requirements for secure information-sharing, rapid processing, ready access to data, and better information management.

Company portals can be based on scalable SGI™ Origin™ servers. The solution comprises an easy-to-use Web interface, enterprise application integration software supporting all industry standards for queries, and access to legacy and current data sources, including all EDM, PDM, CRM, and ERP systems.

SGI collaborates with application developers to build a custom, yet simple Web interface based on the requirements of the manufacturing environment. A wide range of e-business strategies can be realized with applications that drive activities such as electronic change control, electronic requisitions management, e-commerce, Web-based reports, and extranets that enable build-to-order processes.

Software Providers

Powerful Applications for Design and Manufacturing
SGI works closely with the world's most advanced software developers to ensure that their applications make the most of your investment. A large team of skilled engineers tunes software code and implements OpenGL® extensions for graphics to optimize performance on SGI systems. A partial list of SGI software providers includes:

Actify
Active Software
ADINA R&D
ADRA
AEA Technology
Aerosoft
Alias|Wavefront
Alpharel
Altair Computing
ANSYS, Inc.
Autodesk
BEA Systems
Camax
CFD Research Corporation
CLARUS
CoCreate
Computational Dynamics Ltd.
Computational Engineering Inc.
Concentric Software
CSAR Corporation
CSC
Dassault Systèmes
Deneb Robotics
Division
EDS Unigraphics
Eigner & Partner
Engineering Animation, Inc.
Engineering Systems International
Engineous Software
Fakespace
Flomerics
Fluent, Inc.
Gemini Technologies
Hibbitt, Karlsson and Sorensen, Inc.
ICEM CFD Engineering
Informix
Insignia Solutions
Intelligent Light, Inc.
Ivex
Livermore Software Technology Corporation
LMS
MacNeal-Schwendler Corporation
MaK Technologies
Manufacturing and Consulting Services, Inc.
Marconi Simulation
Matra Datavision
MatrixOne
Mecalog SA
Mechanical Dynamics, Inc.
Metaphase
MSC.Software
MultiGen-Paradigm Simulation
Neon
Netscape Communications Corporation
Opticore
Oracle
Parametric Technology Corporation
Pointwise, Inc.
Pyramid Systems
Sherpa
SolidView
SolidWorks
Structural Dynamics Research Corporation
Sybase
Tecnomatix
think3
Thomson Training & Simulation
Varimetrix
Viewpoint Datalabs
Virtual Prototypes, Inc.
Visionary Design Systems
Workgroup Technology

Product Awards

"320 Visual Workstation Awarded Highest Rating by CADalyst"
Review by *CADalyst Magazine*, 1999

"320 and 540 Visual Workstation Awarded Hot Pick at Seybold"
Seybold Editors' Hot Pick, Seybold Seminars 1999

"540 Visual Workstation Awarded Best of Show at Comdex"
PCWeek Magazine Best of Show Award, Comdex 1999

"Octane Workstation Named Best Product by 3D Design"
Evaluation by *3D Design Magazine*, 1997

"Octane Workstation Named Outstanding Product by Unix Review"
Evaluation by *Unix Review Magazine*, 1997

"Origin Servers Named Best Throughput Performer"
AIM Technology 1999 Hot Iron Award, Shared Application Server Mix

"Origin2000 Awarded Outstanding Server Product by Performance Computing"
Review by *Performance Computing Magazine*, 1998

"Cray Supercomputers Enable Top Smithsonian-Honored Innovations"
Top Ten Innovations Recognized for 1999 by *Computerworld Magazine* and the Smithsonian Institution

Solutions at a Glance

	Conceptual Modeling	Design Engineering		PDM and ERP Database Management
		Digital Prototyping	Engineering Analysis	
Silicon Graphics® 320 Silicon Graphics® 540 	Personal industrial design station Shaded surface evaluation Reflection mapping	3D solid modeling of small assemblies or component designs	Pre- and post-processing Small analysis solutions	Web authoring and Web front end to PDM and ERP
Silicon Graphics® O2® 	Personal industrial design station Shaded surface evaluation Reflection mapping	3D solid modeling of small assemblies or component designs	Pre- and post-processing Small analysis solutions Video capture of some animation for communication/collaboration	Web authoring and Web front end to PDM and ERP
Silicon Graphics® Octane® 	Interactive shaded and texture surface evaluation Multiprocessing capabilities for dual tasks	3D solid modeling of large assemblies requiring fast graphics Simultaneous design and analysis with multiprocessing capability Pre- and post-processing of mid-size models	Medium-size solutions on dual-processor systems Combination of graphics and analysis	Web authoring and Web front end to PDM and ERP
Reality Center 	Immersive visualization facilities, from small screens to auditorium-size Interact with entire, actual-size product (all components and assemblies) in real time and in realistic settings Compare ideas by changing colors and features in real time Communicate the most subtle nuances of light and shadow, which affect the "feel" of the product	Hold, manipulate, and operate products naturally before building a costly prototype Evaluate human factors and ergonomic issues using human-scale models Enable clear communication among groups of designers, engineers, and sales and marketing staff at every step of the design process	Visualize air flow, crash tests, noise/vibration, materials, design, etc. at the most detailed resolution available People first; a car crash can be at 1:1 scale Full control over simulation playback—pan, rotate, zoom—even "roam" inside the action Use computational steering applications to view new results within seconds of parameter changes	
Silicon Graphics Onyx2 series 	Ultimate system for high-end visualization Interactive review of ClearCoat "ray trace quality" scenes Interactive shaded surface evaluation for full systems Integration with virtual reality interface technologies for interior and exterior designs	Ultimate system for high-end visualization Expandable Onyx2 InfiniteReality2 for multiple output channels and multiple pipeline displays Multiscreen, life-size, full model, collaborative digital prototyping Reality Center facilities	Complex analysis problems requiring high parallelism or throughput as well as integrated graphics	
SGI™ Origin™ 200 SGI™ Origin™ 2000 	High availability and IRIS FailSafe™ configuration to support project teams up to complete enterprises Performance architecture for file and database serving	High availability and IRIS FailSafe configuration to support project teams up to complete enterprises Performance architecture for file and database serving	All sizes of complex problems requiring multidisciplinary engineering solutions Large file and product management Highly tuned commercial applications	Workgroup to enterprise server for full product life cycle data management for models, documents, test data, and financial data High reliability with IRIS FailSafe, RAID configurations

SGI Global Services: Your Complete Solutions Partner

Powerful SGI computers become that much more productive when our teams tailor their setup, service, and support to maximize our customers' investment and increase their competitive edge. The industry and technology experts at SGI Global Services take a collaborative partnership approach by providing a full range of technical support services, industry-expert consulting, leading-edge knowledge, customized industry solutions, and long-term equipment availability. With our core expertise in Customer Services, Remanufactured Products, Consulting, Custom Engineering, and Customer Education, SGI Global Services is the total solution partner for all of our customers' needs.

To obtain more product, application, and solution information, visit our Web site at *www.sgi.com/manufacturing*.

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